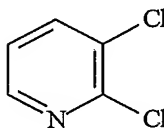


CLAIMS

What is claimed is:

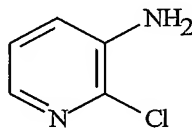
1. A method for preparing 2,3-dichloropyridine **1**,



**1**

- 5 comprising the steps of:

(1) contacting a 3-amino-2-chloropyridine **2** or a solution comprising 3-amino-2-chloropyridine **2**



**2**

with hydrochloric acid to form a 3-amino-2-chloropyridine hydrochloric acid salt;

- 10 (2) contacting the 3-amino-2-chloropyridine hydrochloric acid salt with a nitrite salt to form a corresponding diazonium chloride salt; and

(3) contacting the corresponding diazonium chloride salt with hydrochloric acid in the presence of a copper catalyst wherein at least about 50 % of the copper is the copper(II) oxidation state, optionally in the presence of an organic solvent, to form 2,3-dichloropyridine

- 15 **1**.

2. The method of Claim 1 wherein the nitrite salt is sodium nitrite.

3. The method of Claim 1 wherein at least about 75 % of the copper is the copper(II) oxidation state.

- 20 4. The method of Claim 3 wherein at least about 90 % of the copper is the copper(II) oxidation state.

5. The method of Claim 4 wherein at least about 95 % of the copper is the copper(II) oxidation state.

6. The method of Claim 5 wherein at least about 99 % of the copper is the copper(II) oxidation state.

- 25 7. The method of Claim 6 wherein 100 % of the copper is the copper(II) oxidation state.

8. The method of Claim 1 wherein the copper catalyst comprises copper(II) chloride or copper(II) oxide.

9. The method of Claim 8 wherein the nominal mole ratio of the nitrite salt to the 3-amino-2-chloropyridine **2** is about 0.95 to about 2.0; the nominal mole ratio of the copper(II) chloride or copper(II) oxide to the 3-amino-2-chloropyridine **2** is about 0.05 to about 2.0 when 100 % of the copper is copper(II) chloride or copper(II) oxide; the nominal mole ratio of hydrochloric acid to the 3-amino-2-chloropyridine **2** in step (1) is about 3 to about 10; and the nominal mole ratio of hydrochloric acid to the 3-amino-2-chloropyridine **2** in step (3) is about 0 to about 10.

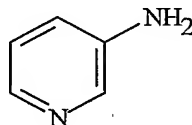
10. The method of Claim 9 wherein the nominal mole ratio of the nitrite salt to the 3-amino-2-chloropyridine **2** is about 0.95 to about 1.1; the nominal mole ratio of the copper in the copper catalyst to the 3-amino-2-chloropyridine **2** is about 0.2 to about 0.6; the nominal mole ratio of the hydrochloric acid to 3-amino-2-chloropyridine **2** in step (1) is about 3 to about 6; and the nominal mole ratio of the hydrochloric acid to the 3-amino-2-chloropyridine **2** in step (3) is about 1 to about 5.

11. The method of Claim 1 wherein steps (1) and (2) are conducted at a temperature ranging from about -15 to about 20 °C; and step (3) is conducted at a temperature ranging from about 30 to about 90 °C.

12. The method of Claim 11 wherein steps (1) and (2) are conducted at a temperature ranging from about -10 to about 10 °C; and step (3) is conducted at a temperature ranging from about 50 to about 80 °C.

13. The method of Claim 1 wherein the 3-amino-2-chloropyridine **2** or the solution comprising the 3-amino-2-chloropyridine **2** is prepared by a method comprising the steps of:

(a) contacting 3-aminopyridine **3** or a solution comprising 3-aminopyridine **3**



**3**

with hydrochloric acid to form a 3-aminopyridine hydrochloric acid salt;

(b) contacting the 3-aminopyridine hydrochloric acid salt with a chlorinating agent to form the solution comprising the 3-amino-2-chloropyridine **2**; and

(c) optionally isolating the 3-amino-2-chloropyridine **2** from the solution of step (b).

14. The method of Claim 13 wherein the chlorinating agent is chlorine, an alkali metal hypochlorite or a mixture of hydrochloric acid and hydrogen peroxide.

15. The method of Claim 14 wherein the chlorinating agent is chlorine or a mixture of hydrochloric acid and hydrogen peroxide.

16. The method of Claim 13 wherein the nominal mole ratio of hydrochloric acid to the 3-aminopyridine **3** in step (a) is about 3 to about 20; and the nominal mole ratio of the chlorinating agent to the 3-aminopyridine **3** is about 0.6 to about 1.5.

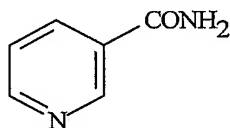
17. The method of Claim 16 wherein the nominal mole ratio of hydrochloric acid to the 3-aminopyridine **3** in step (a) is about 5 to about 15; and the nominal mole ratio of the chlorinating agent to the 3-aminopyridine **3** in step (a) is about 0.8 to about 1.2.

18. The method of Claim 13 wherein steps (a) and (b) are conducted at a temperature ranging from about 0 to about 60 °C.

19. The method of Claim 18 wherein steps (a) and (b) are conducted at a temperature ranging from about 10 to about 35 °C.

20. The method of Claim 13 wherein the 3-aminopyridine **3** or the solution comprising the 3-aminopyridine **3** is prepared by a method comprising the steps of:

(i) contacting nicotinamide **4**



**4**

with a strong base and a halogenating agent to form a mixture comprising an *N*-halonicotinamide salt;

(ii) contacting the *N*-halonicotinamide salt mixture formed in step (i) with heated water to form an aqueous mixture and maintaining the aqueous mixture at a temperature ranging from about 65 to about 100 °C to form the solution comprising 3-aminopyridine **3**;

(iii) isolating the 3-aminopyridine **3** from the solution of step (ii) if the halogenating agent is other than a chlorinating agent; and

(iv) optionally isolating the 3-aminopyridine **3** from the solution of step (ii) if the halogenating agent is a chlorinating agent.

21. The method of Claim 20 wherein the strong base is an alkali metal hydroxide.

22. The method of Claim 21 wherein the alkali metal hydroxide is sodium hydroxide.

23. The method of Claim 20 wherein the halogenating agent is chlorine, bromine, or sodium hypochlorite.

24. The method of Claim 20 wherein the nominal mole ratio of the strong base to nicotinamide 4 is about 1 to about 5; and the nominal mole ratio of the halogenating agent to nicotinamide 4 is about 0.8 to about 2.0.

5 25. The method of Claim 24 wherein the nominal mole ratio of the strong base to nicotinamide 4 is about 2 to about 4 when the halogenating agent is chlorine or bromine; the nominal mole ratio of the strong base to nicotinamide 4 is about 1 to about 2 when the halogenating agent is sodium hypochlorite; and the nominal mole ratio of halogenating agent to nicotinamide is about 0.9 to about 1.1.

10 26. The method of Claim 20 wherein step (i) is conducted at a temperature ranging from about -5 to about 20 °C.

27. The method of Claim 26 wherein step (i) is conducted at a temperature ranging from about 0 to about 10 °C; and step (ii) is conducted at a temperature ranging from about 70 to about 95 °C.